Before The
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Sensible Medical Innovations	)	ET Docket No. 18-39
Request for Waiver of Part 15 of the Commission's Rules Applicable to Ultra-Wideband Devices	)	

EX PARTE COMMENTS OF THE GPS INNOVATION ALLIANCE

The GPS Innovation Alliance ("GPSIA") hereby submits these *ex parte* comments on the Sensible Medical Innovations Ltd. ("SMI") Request for Waiver ("Request") filed on January 16, 2018. SMI's Request seeks waivers of several Part 15 rules to enable it to market an ultra-wideband ("UWB") medical monitoring device described as the ReDS system.[1]

In its comments on SMI's Request, the GPSIA recounted the lengthy and exacting process by which the Commission adopted the Part 15 UWB rules and explained the important technical and operational protections that were put in place to safeguard Global Positioning System ("GPS") Radio Navigation Satellite Service ("RNSS") signals from unwanted emissions from UWB devices.[2] The GPSIA pointed out that SMI, in its Request, had expounded on the

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[1] See *Sensible Medical Innovations Request for Waiver*, ET Docket No. 18-39 (filed Jan. 16, 2018) ("Request"); *see* Public Notice, *Office of Engineering and Technology Seeks Comment on Sensible Medical Innovations Ltd.'s Request for Waiver of Part 15 Ultra-Wideband Rules for a Medical Imaging System*, DA 18-131 (rel. Feb. 9, 2018). SMI specifically seeks a waiver of the definition of ultra wideband transmitter in Section 15.503(d), the permissible frequency range for UWB devices prescribed in Section 15.513(d), the UWB measurement procedures in Section 15.31(c) and 15.521(d), and the UWB coordination requirements of Section 15.525.

[2] Comments of the GPS Innovation Alliance at 3, (filed March 12, 2018) ("GPSIA Comments"); *see Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems*, First Report and Order, 17 FCC Rcd. 7435, 7461 ¶ 71 (2002) ("*2002 UWB Decision*"); see *Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems*, Notice of Proposed Rulemaking, 65 Fed. Reg. 37332 (2000) ("*UWB NPRM*"); *see also Revi-*

little to no risk of interference."[7] GPSIA also observed that SMI supplies no technical data beyond a few selected results to support its general representations regarding power, attenuation, and other signal characteristics. GPSIA urged the Commission to require SMI to clarify what, if any, emissions testing it has performed, and submit into the public record the detailed results of any such tests, for the review of the Commission and other stakeholders.[8]

In reply comments, SMI submitted additional information in response to GPSIA's comments.[9] Specifically, SMI identified the 16 specific frequencies that the ReDS Systems signal sweeps through, and with respect to the RNSS frequencies, SMI stated that its "tests have shown that peak power in these frequencies is below 47 dBuV/m at a distance of three meters."[10] SMI further stated that its "link budget calculation . . . indicates that signals from the ReDS System are below the GPS noise level under worst case conditions at a distance of 50 meters or more."[11] SMI provides a GPS interference calculation at 1164.0625 MHz showing a maximal ReDS peak and average power of 47 dBu/m and 26 dBuV/m at three meters. SMI states that "the very worst case peak power from a ReDS device will be 5.1 dB below a GPS receiver's noise floor at a distance of 50 meters, and average power will be 26 below."[12]

Unfortunately, SMI's response does little to dispel concerns that the ReDS device operations, as proposed, will jeopardize GPS signals. At the outset, GPSIA notes that SMI's

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7 Request at 7. SMI argued that there should be little concern because the next frequency step is 1243.0625 MHz, but also failed to identify any of the *other* frequencies to be used. 1243.0625 MHz, of course, is also within an RNSS band, so it is unclear why SMI suggests that this next step would be of little concern.

8 GPSIA Comments at 6.

9 Reply Comments of Sensible Medical Innovations at 2 (filed March 27, 2018) ("SMI Reply").

10 SMI Reply at 3.

11 *Id.* at 3-4.

12 *Id.* at 4.

Request does not include a request for a waiver of the Section 15.513(e) power limits applicable to medical imaging systems,[13] which specifies that for operations on 1164.0625 MHz an average EIRP of -75.3 is the limit. Based on the emissions information provided in SMI's response, the GPSIA calculates that the ReDS system will operate at an average EIRP of -69.23 dBm at 1164.0625 MHz, which is 6 dB in excess of the permissible limit set forth in Section 15.513(e). SMI proposes operation in excess of the permissible power limit yet SMI provides no rigorous analysis of the potential impact of such co-channel operations on GPS. SMI suggests only that GPS should be assumed to be protected from interference because the ReDS system is a "low power transmission," used indoors, would operate in low density configurations, has a very low duty cycle per day per patient, and "energy is coupled into a patient's body resulting in extremely low power leakage."[14] SMI also states that GPS receivers would further filter the ReDS device signal because 1164.0625 MHz "is on the very edge of the L5 band and outside of modulation main lobe."[15]

Despite GPSIA's urging in its Comments, SMI has not provided comprehensive test data or technical analysis and still has not provided details of its testing – if any – that support its sweeping conclusion that the likelihood of interference to GPS from this co-channel operation is "extremely low." Indeed, based on what little information SMI provided about its analysis, GPSIA questions the appropriateness of using 50 meter spacing to calculate a

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13 47 C.F.R. 15.513(e). SMI's Request seeks only waivers of the definitions of ultra wideband transmitter in Section 15.503(d), the permissible frequency range for UWB devices prescribed in Section 15.513(d), the UWB measurement procedures in Sections 15.31(c) and 15.521(d), and the UWB coordination requirements of Section 15.525.

14 *Id.*

15 *Id.*

"worst case scenario."[16] In light of the near ubiquity of GPS-enabled devices,[17] 50 meter spacing would be a very optimistic scenario and would not be reflective of actual operations. For instance, the Broadcom BCM47755 GNSS chipset for smart phones enables positioning using GPS L5 and L1 signals. These smart phones will certainly be used indoors and operated much closer than 50 meters from an SMI ReDS system. SMI should account for such likely scenarios in its analysis. Further, the 50 meter spacing that SMI used is in stark contrast to the approach taken by the National Telecommunications and Information Administration ("NTIA") when the UWB rules were first developed.[18] In the *2002 UWB Decision,* the Commission observed that "[w]hen considering interference to GPS E-911 receivers from a single indoor system, NTIA employed a minimum separation distance of 2 meters in this analysis."[19]

The Commission takes a conservative approach to granting waivers that permit parties to operate equipment free from co-channel interference with incumbent operations, placing a heavy burden on the party requesting the waiver to demonstrate how it will provide adequate protection from interference.[20] Although the medical benefits of the proposed ReDS device may be substantial, GPS and other radio services that may be affected by UWB interference also serve important

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16 *See id.* at 3-4.

17 GPS navigation is deeply embedded in many consumer, commercial, industry, and government functions and is an essential component to many applications bearing on health and safety of life. Examples are too numerous to recount but include applications in key public and government transportation systems, including aviation, railway, automobile, trucking, maritime, as well as use by first responders in public safety applications, industrial use in construction, forestry, etc. *See* RNSS Uses, http://www.insidegnss.com/auto/janfeb18-LAW.pdf (describing RNSS safety-of-life applications).

18 *See 2002 UWB Decision.*

19 *Id.* at p. 40, para. 106.

20 *See, e.g., Request by Itron, Inc. for Waivers of the Commission's Rules*, Opinion, 30 FCC Rcd. 137 (2015) ("*Itron Denial*").

public safety and health purposes.[21] On the current record, the Commission cannot find that the claimed benefits of ReDS outweigh the benefits of applying the rules, or that the proposed waiver will not undermine the purpose of the rules.

Respectfully submitted,

/electronically signed/
Mark N. Lewellen
GPS INNOVATION ALLIANCE

Dated: November 16, 2018

21 *See supra*, note 18.